

NEW MANITOBA DISTRICT

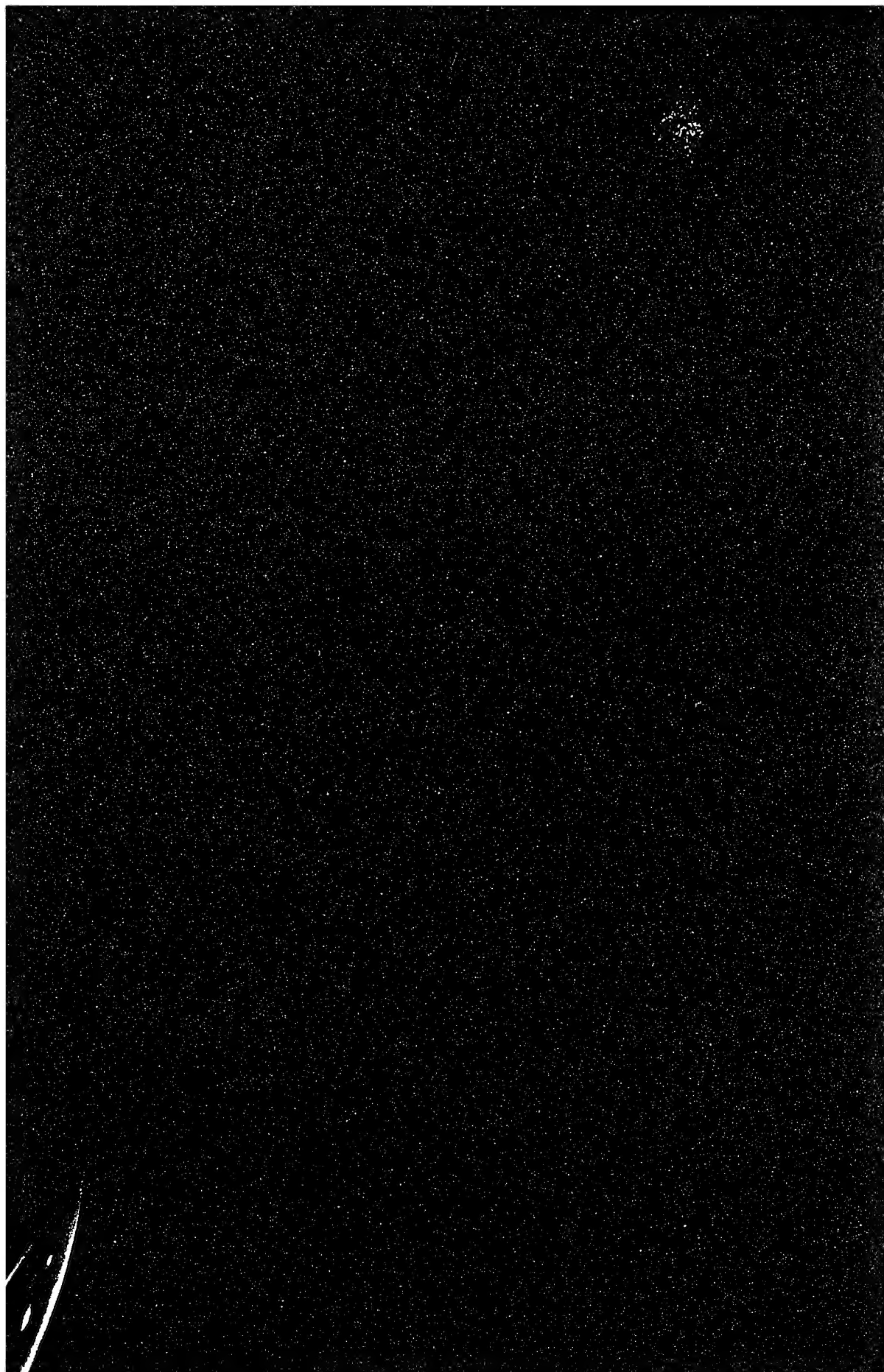
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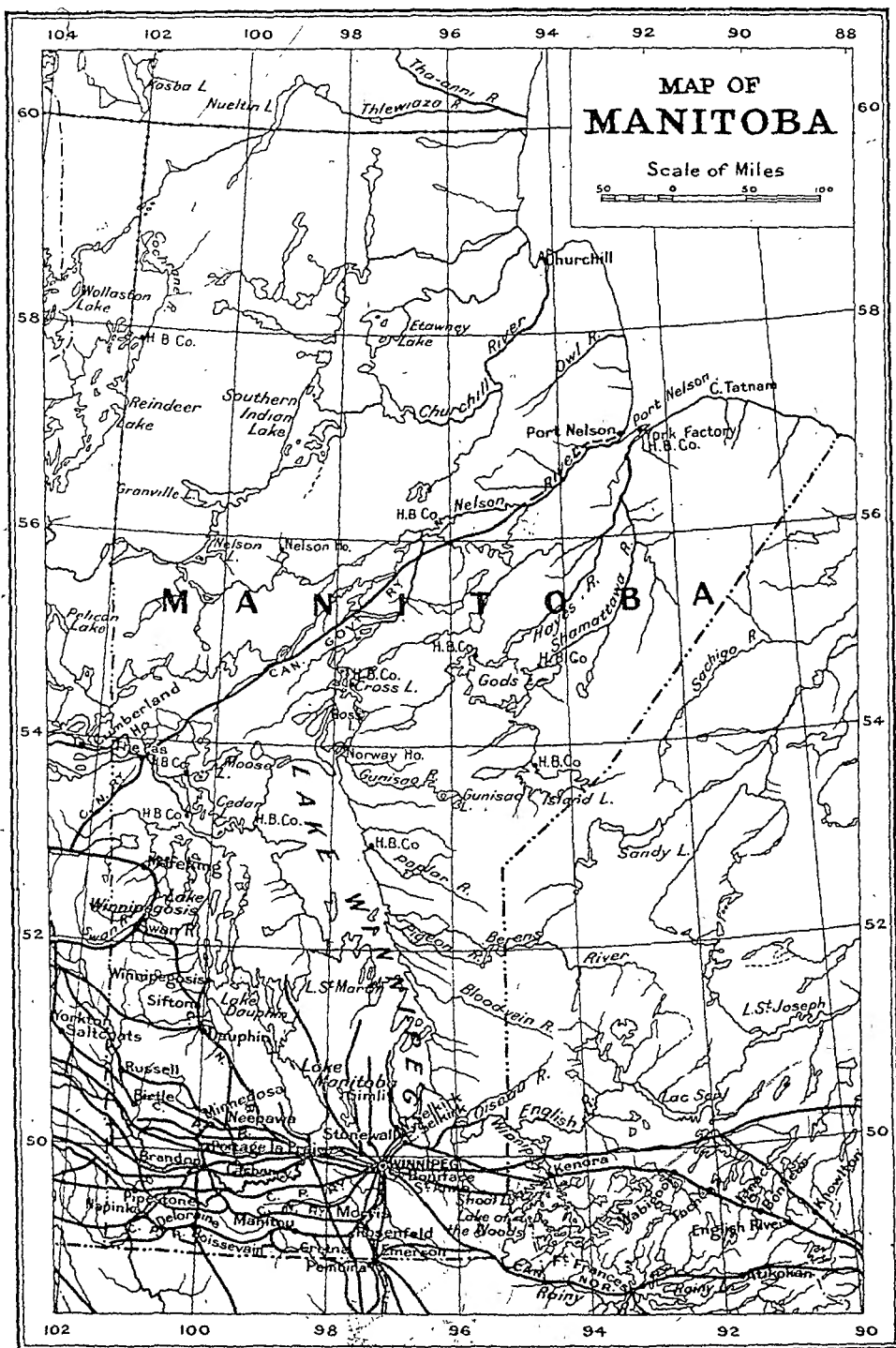
PROVINCE OF MANITOBA

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LEGISLATIVE ASSEMBLY

IN THE YEAR 1892





THE NEW MANITOBA DISTRICT CANADA

ITS RESOURCES AND DEVELOPMENT

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Prepared under the direction of the Superintendent
Natural Resources Intelligence Branch

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Department of the Interior
Canada

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THE NEW MANITOBA DISTRICT, CANADA

ITS RESOURCES AND DEVELOPMENT

LOCATION AND EXTENT

In the year 1912 the Dominion Government granted to the province of Manitoba an extension of boundaries to enlarge its area so as to more nearly agree with that of the newly created western provinces of Saskatchewan and Alberta. The enlargement extended northerly to the 60th parallel of latitude, which is the north boundary of these two new provinces, and northeasterly to Hudson bay, absorbing practically the southern part of the old district of Keewatin. This added territory is 178,100 square miles in extent, over twice the area included in the old boundaries, and makes the extent of the province now 251,832 square miles. Saskatchewan's area is 251,700 square miles and that of Alberta 255,285 square miles. The portion added to the old province is variously known as "Northern Manitoba" or "New Manitoba". As the province formerly extended as far north as township 44, and very little settlement had reached beyond Swan river, which is in township 36, it may readily be inferred that but little was known of the newly annexed territory. As it lay principally beyond lake Winnipeg and the Saskatchewan river it was in danger of being lightly dismissed as a "northern wilderness," and overlooked for long years.

One of the principal factors in bringing it into prominence; however, was the construction of the Hudson Bay division of the Canadian Government railways. This road, now nearing completion, will extend from the town of The Pas, on the Saskatchewan river, to Port Nelson, on the westerly shore of Hudson bay. It will be 424 miles in length, entirely within the bounds of "New Manitoba." With the opening of this railway the resources of the newly acquired territory will be made more apparent to those in the older parts of the province and to the public generally.

Realizing the importance of these resources and in order to facilitate their development, the Provincial Government has appointed a "commissioner" to represent it in this district until its organization can be more fully effected. This official is located at The Pas, the metropolis of the new district, and is vested with the necessary power to act as the representative of the local Government. The Pas is situated on the Saskatchewan river, on its south bank, and at the mouth of the Pasquia river. It lies in township 56, range 26, west of the Principal meridian. It was surveyed and placed on the market in 1910 and incorporated as a town in 1912. Prior to these dates it was a prosperous northern village and the centre of a thriving trade in fur and fish. The northern terminus of the Canadian Northern Railway branch from Hudson Bay Junction is located here and it is also the southern terminus of the Hudson Bay section of the Canadian Government railway.

The river has been spanned at this point by a steel bridge, and the Government railway is rapidly nearing completion, the end of steel now being within

92 miles of Port Nelson. During the summer months a weekly train service has been operated as far as the end of steel, and has proved a great boon to miners and prospectors.

The Pas is a thriving northern town with a considerable trade in fur and fish, a large lumbering industry and a floating population engaged in railway construction, mining and prospecting. Good accommodation is available, and ordinary supplies for the field can be obtained at reasonable rates. The town is well provided with schools, churches, and hospitals, and has also a powerful wireless station.

The Pas is reached by rail over a branch line from Hudson Bay Junction, a point on the Winnipeg-Prince Albert section of the Canadian Northern railway. From Winnipeg to The Pas the distance is 483 miles via Canadian Northern railway. At present the service consists of three passenger trains a week, leaving Winnipeg Mondays, Wednesdays, and Fridays, at 8.15 a.m., with through sleepers to The Pas and dining car to Hudson Bay Junction. These trains reach The Pas the following mornings, the time taken being approximately 24 hours. Three trains a week are also run by the same railway from Prince Albert, connecting at Hudson Bay Junction with The Pas section of the Winnipeg train. The distance from Prince Albert to The Pas is 248 miles, and the time required is 16½ hours. From points east and south the route to The Pas is via Winnipeg, and from Western Canada via Prince Albert.

Port Nelson is also provided with a wireless station. Great preparations are under way to make this an extensive seaport, as it is anticipated, that with the completion of the railway, much of the produce of the western agriculture fields will be shipped by this route.

The discovery of valuable mineral deposits has also attracted considerable attention to Northern Manitoba. It is becoming more and more evident that this vast territory holds wonderful resources in minerals, timber, fur, and fish which have scarcely yet been touched. Wheat has, for so many years, been the symbol of Manitoba's wealth that one instinctively overlooks all else, whereas the area of wheat land is only a very small percentage of the total area of the province.

TOPOGRAPHICAL FEATURES

The name "Manitoba" has so long been associated with vistas of extensive prairies that it seems incongruous to connect with it physical characteristics of a different nature. The earliest pictures have left an indelible impression of vast seas of waving flowers and grass, of Indian lodges and roaming buffalo. With the influx of agricultural settlement the flowers and grass have given place to fields of golden grain, and the primitive Indians and buffalo to busy threshing scenes with rows of tall grain elevators in the background, or long trainloads of wheat rushing eastward to pour their treasures into the funnels of commerce. Once more the pictures must be altered, for though the prairies of Manitoba are beautiful and extensive, they comprise only about five per cent of the total area of the province. In Northern Manitoba they are entirely lacking.

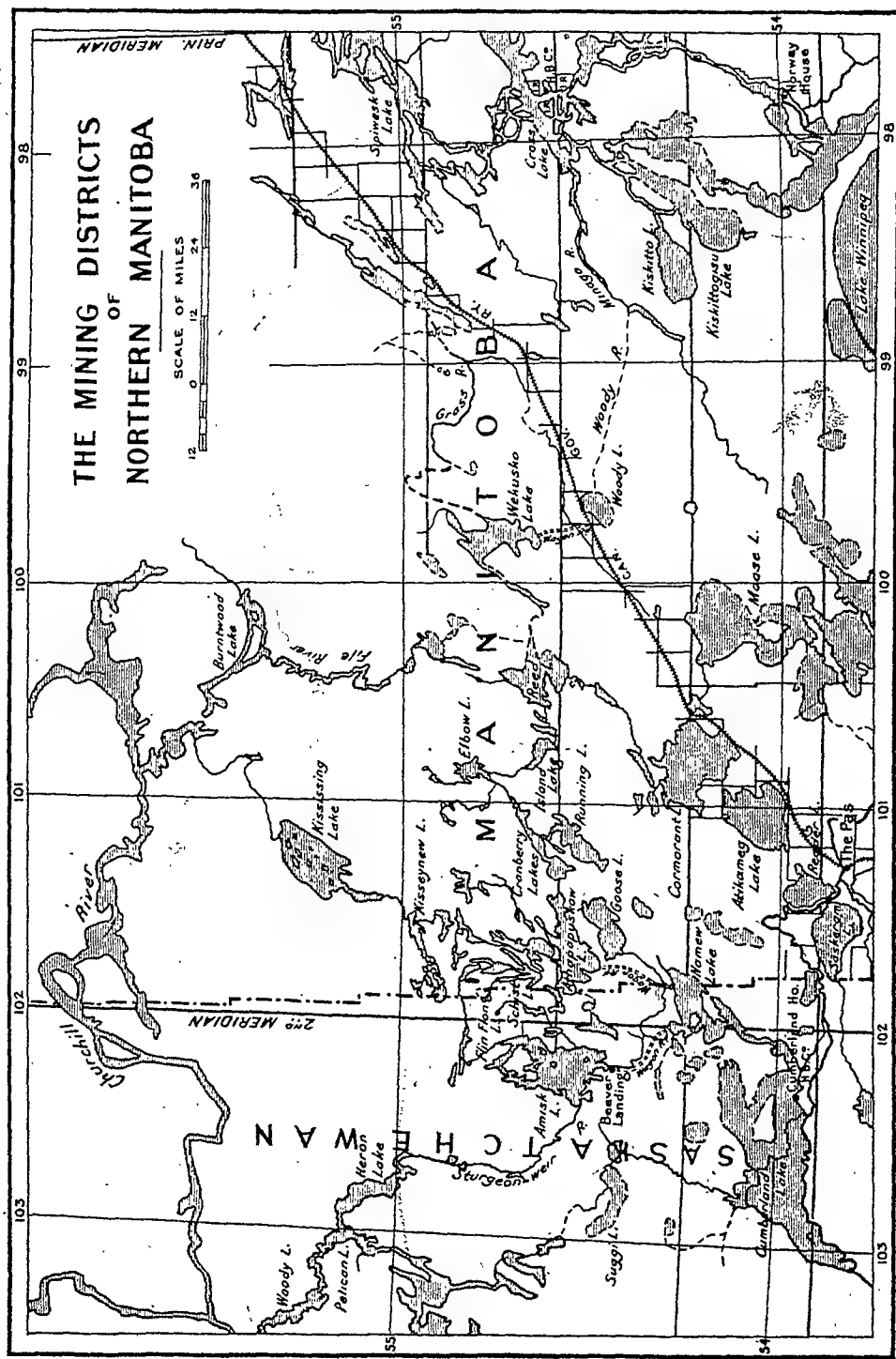
The general physical character of Northern Manitoba may be described as rough and broken. It is not a mountainous region. Taken as a whole it is fairly level, with a general drainage slope northeasterly to Hudson bay. The outstanding features are lake Winnipeg and four large rivers, the Churchill, the Nelson, the Hayes, and the Saskatchewan. Of these four rivers the three former lie almost wholly within this province, and drain directly into Hudson bay. The lower reaches of the Saskatchewan lie within the province and the northern part of lake Winnipeg, into which it drains, is also within New Manitoba. The waters of this lake find an outlet into Hudson bay, so that the entire area of Northern Manitoba drains into the bay.

The country in the vicinity of the town of The Pas is low and marshy and subject to considerable flood. The Saskatchewan river winds a tortuous course between Cumberland and Cedar lakes, through a network of changing channels. On either side are found large shallow lakes, merely separated from the river by natural levees and acting as vast reservoirs, receiving water from the river at its high stages and feeding it when it is low. Pasquia, Saskeram, Reeder, and Barrier lakes are of this type. The soil, however, in this section is very fertile, there is considerable valuable timber, and by drainage a good agricultural area might be redeemed. Between Cedar and Winnipeg lakes are found the Grand rapids of the Saskatchewan, where considerable water-power is available.

North of the Saskatchewan river and lake Winnipeg the nature of the surface changes rapidly. The country rises and the swamps give way to ridges and limestone ledges. The waters of the lakes and rivers become clearer and swifter. Farther north the limestone gives way to granites and schists. The surface of the country becomes broken with a network of countless lakes and streams. Many of the larger lakes contain numerous islands, and rapids and waterfalls are found on the streams. The shores of the lakes and streams become rocky, in places cliffs of rock upwards of 200 feet in height overhang the waters. Rocky ridges, intercepted by swampy ravines, extend from lake to lake. The country is generally thickly wooded, except for numerous grassy meadows along the streams.

Along the Hudson Bay railway, commencing about 125 miles from The Pas, an extensive clay belt is encountered, which promises to make a good agricultural district. It is fairly well wooded. Some open land, resembling the barren lands of the north, is also encountered north of the railway. The soil is wet and cold, and what little tree growth appears is very stunted on these level tracts. It is possible, however, that much of this area can also be redeemed by drainage. The upper waters of the Churchill, Nelson, and Hayes rivers are swift and turbulent, except where widened out into numerous lakes. Approaching Hudson bay they become more placid and widen out into vast rivers, the mouths of which provide harbours for vessels sailing on the bay.

The shores of Hudson bay are generally low and level. At Churchill the country is open and the "barren lands" of the north are found to the northwest of this point. The greatest elevation throughout the district probably does not exceed 1,500 feet above sea level.



THE NEW MINING DISTRICT

Within the past few years there has come to the attention of keen observers the fact that in northern Manitoba and Saskatchewan lies a belt of highly mineralized rock which promises to produce a crop of no mean proportions. This particular section of the vast northern portions of the provinces is variously known as "The Beaver Lake Mining District," "The Pas Mining District," or by other local names. The original discoveries were made on the shores of Amisk lake, locally known as Beaver lake, hence the former name, while the latter name is applied in view of the fact that the natural gateway into the district is by way of the town of The Pas, the centre of the district being about 60 miles due north of it.

This mining district might be roughly designated as lying on the Manitoba-Saskatchewan boundary, and midway between the Saskatchewan and Churchill rivers. It extends almost east and west in length, bearing slightly northeast and southwest. It is about 125 miles in length by 25 miles in breadth. By the Dominion Lands system of survey it will extend in length from range 15 west of the Principal meridian to range 5 west of the Second meridian, both inclusive, and in breadth from township 64 to township 67, both inclusive. These surveys are only partially delineated on the ground. Within this area are embraced the principal discoveries and mining operations north of the Saskatchewan river.

As the predominating topographical feature of this mining area is the network of lakes extending over it, naturally the various centres of activity have come to be identified by the lake adjacent to them. From west to east across the mineral region the principal lakes forming a natural canoe route and main thoroughfare of travel are: Amisk (or Beaver), Flin-Flon, Schist, Athapapuskow, Cranberry lakes (three in number), Elbow, Island, Reed, Sandy, and Wekusko (or Herb). Goose lake lies south of Athapapuskow lake and, while outside the mineral area, being in limestone formation, is a connecting link in the canoe route from Sturgeon Landing.

Before the construction of the road into Wekusko lake there was considerable canoe traffic from mile 137 of the Hudson Bay railway by way of Setting lake and Grassy river, which extend westerly from this mile point to Wekusko lake. The short haul made possible by the new road has almost done away with this long canoe route. Various lakes lie north of the principal route mentioned, on one of which, Copper lake, good indications of sulphide ore bodies are in evidence. Trout is another lake the shores of which are attracting the prospectors' attention.

The principal centres of interest made prominent by virtue of notable discoveries are those adjacent to the four following lakes, namely: Amisk (or Beaver), Flin-Flon, Schist, and Wekusko (or Herb). Beaver lake lies on the western extremity of the belt, Flin-Flon and Schist are more central, and Herb is on the eastern extremity.

The Manitoba-Saskatchewan boundary line will cut this district just to the west of the Flin-Flon and Schist deposits, thus placing the Beaver Lake field in the province of Saskatchewan and the remainder of the district in the province of Manitoba. As the mineral rights, however, are all vested in the Dominion Government, and administered by federal officials, the matter of provincial boundaries becomes of little concern in the early stages of development. It might be noticed, however, that the provincial boundary is also the division line between two Mining Recording divisions which cover this district. That part lying within the province of Saskatchewan is included in the Prince Albert mining district, the recording office of which is in the city of Prince Albert, located in the post office building. That part lying within the province of Manitoba, however, falls within the limits of The Pas mining district, the recording office of which is in the town of The Pas.

From The Pas two district routes to the mineral fields are open during the season of navigation, namely, northwesterly via steamboat and northeasterly via railway. The former is the more direct route to the sulphide fields at Schist and Flin-Flon lakes, and the latter to the gold fields of Herb lake. On the former route the Ross Navigation Company, Limited, operate a steamboat service from The Pas to Sturgeon Landing, via the Saskatchewan river, Cumberland lake, Cross lake, Whitey narrows, and Sturgeon or Namew lake. A weekly and generally a semi-weekly service is maintained. The boat trip is about 150 miles, and takes from $1\frac{1}{2}$ to 2 days. A new passenger boat was launched last year. It provides good accommodation, and both passenger and freight rates are very reasonable. In addition to this service, occasional trips are made down the Saskatchewan as far as Cedar lake and Grand Rapids.

From Sturgeon lake two wagon roads lead into the interior. One runs from Shining bay to Beaver or Amisk lake, a distance of 18 miles. This road lies in the province of Saskatchewan, and was built a few years ago by the government of that province, when the rush to Beaver lake took place. It is still in fair condition, with road houses at either end, but no freighters operate there now. The other road was built last year by the Manitoba Government from Sturgeon landing, at the mouth of Sturgeon river, to Athapapuskow lake, a distance of 17 miles. It is in good condition, and both freight teams and gasoline tractors operate on it. The alternative route is via Hudson Bay railway as far as mile 82, from which point the Manitoba Government built a road into Herb lake last year. This road is in good condition, with road house at either end, and freight teams operating it.

From the ends of any of these roads the district is easily traversed by canoe, portages being comparatively few and usually short. A few gasoline and some sail-boats are found on Beaver lake, while a 52-foot tug operates on Athapapuskow lake, and a small stern-wheel steamer on Schist lake. These latter boats belong to the Mandy Mining Company. A new wagon road has recently been cut out from Schist to Flin-Flon lake, a distance of about four miles.

GEOLOGICAL FEATURES

Geological explorations and surveys in Northern Manitoba have, like other researches in this new district, been of a limited nature. Earliest explorers and travellers were in too great haste, or too occupied in discovering routes of travel and establishing centres of fur trade, to pay much attention to the geology of the district. Casual mention of indications of certain minerals or descriptive reference to the nature of the surface of the country traversed constituted the only information available concerning this subject until within comparatively recent years.

Geological expeditions conducted by Messrs. J. B. Tyrell, Wm. McInnis, and D. B. Dowling for the Geological Survey of Canada at various intervals during the past twenty-five years have resulted in demonstrating the possibility of discoveries of minerals of economic value, and have given the public a general knowledge of the geology of the district. During the past five years, Dr. E. L. Bruce, of the Geological Survey, has conducted more detailed examinations of the new mining district referred to in a previous chapter. Reports of these expeditions and investigations are available on application to the Director, Geological Survey of Canada, Ottawa.

The particular points of interest in Northern Manitoba at present, from a prospecting and mining standpoint, viz., Flin-Flon lake, Schist lake (on which is located the Mandy mine), and Herb lake are described by Dr. Bruce in an article appearing in the March Bulletin of the Canadian Mining Institute, from which the following extracts are taken:—

GEOLOGY OF THE FLIN-FLON AND SCHIST LAKE DISTRICT

The sulphide ore deposits are found in the oldest series of rocks recognized in the district, but generally they belong to a much later period. The wall rock of the Mandy deposit is chlorite schist associated with massive greenstone. At Flin-Flon the ore is also in a schistose zone in massive ellipsoidal-weathering lavas. Lithologically, these rocks are not unlike the Keewatin of Ontario, but they may, or may not, be of the same age. Northward these rocks are overlain by gneisses. A short distance northeast of Flin-Flon there is a small boss of granite porphyry which may be responsible for some of the sulphide but not for the important mineralization. A thick series of sediments, largely conglomerate, arkose, and greywacke, overlies the greenstone series, and is probably also later than the granite porphyry. All of these formations have been intruded by great batholiths of granite gneiss and massive granites. Sulphide lenses are found closely associated with dikes and small masses of these intrusives, and it is believed that to them must be ascribed the chief mineralization. The granite is the latest Pre-Cambrian formation and the last rock to be involved in the ore deposition. The Ordovician dolomite and the glacial and post glacial deposits simply form a mantle over the older formations, and have nothing to do with the ores except that they may possibly conceal them.

THE MINERAL DEPOSITS

The sulphide body at the Mandy is lenticular, with a total length of 225 feet and a maximum width of 40 feet on the surface. The ore being shipped comes, however, from a mass of high-grade chalcopyrite 100 feet in length by 12 feet in width on the surface, and widening to over 18 feet at the 100-foot level. The ore lens is separated from the schist of the footwall by a 10-foot band of pyrite, and between the chalcopyrite and the hanging-wall there are 10 to 12 feet of zinc blende and another band of pyrite. The segregation of these minerals is not as complete as this description suggests, but the chalcopyrite lens in the middle is sufficiently free from zinc to cause no difficulty in smelting. Apparently during the close folding of the older rocks of the district the schistose bands at the Mandy were crumpled into a large drag fold which was mineralized by pyrite. A second period of fracturing occurred, opening up spaces

in the first sulphide replacement, and chalcopyrite and zinc blende were introduced, filling these openings and replacing the earlier minerals. The alteration of the country rock is of the type produced by hot aqueous solutions, and it is reasonable to believe that these were the final emanations from the cooling granites that are found in the vicinity of the ore deposits.

The Flin-Flon ore body lies 4 miles northwest of the Mandy. It is a mineralized shear zone in massive greenstone. In places this deposit has a width of 75 feet of solid sulphides, and diamond drilling has proven the continuation of the mineralized zone for over 2,500 feet. It carries a smaller proportion of chalcopyrite and zinc blende to pyrite than the Mandy lens, and at Flin-Flon no segregation of sufficiently high copper-content to bear the cost of transportation under present conditions has yet been discovered.

A few other prospects have received some attention, but these are as yet not important. Some of them show zones of chalcopyrite stringers which may not be associated with deposits of any size. This can only be determined by exploration. They are, at any rate, indications of other possible bodies of ore.

Although most of the ore produced has come from the Schist Lake district, there has been considerable activity at Herb lake at the eastern end of the belt of basic Pre-Cambrian rocks. Promising quartz veins are being developed on the claims of the Northern Manitoba Mining Development Company, at the Rex, Elizabeth, Dauphin, and other properties. Only one small shipment has as yet been made. This consisted of 28½ tons of quartz from the shaft of the Northern Manitoba Mining and Development Company, which returned \$2,323. A mill is now being installed on the Rex, and shafts are being sunk on several other claims. Herb lake is only 11 miles from the Hudson Bay railway, and a wagon road has now been constructed which will serve fairly well the needs of a gold quartz mining camp.

GEOLOGY OF THE HERB LAKE DISTRICT

The geology of the Herb Lake district is somewhat similar to that of the Schist Lake district, but among the lavas there are many acid flows. Some of the sediments are metamorphosed into staurolitic, cyanitic, and granite schists, and the relations of these with the greenstone series and with the sedimentary gneisses is extremely complicated. The older highly metamorphosed rocks are intruded by diorite, granodiorite, and granite.

The veins are the typical lenticular quartz veins so commonly found in the Pre-Cambrian. The wall rocks in places carry considerable auriferous arsenopyrite, but in the quartz gold occurs native or as the telluride. Nests or masses of tourmaline are found in most veins, and the gold may occur in these as well as in the quartz. Evidently the gold veins are high-temperature deposits and are probably directly connected with some of the late intrusives.

CONCLUSIONS

In this brief review of mining in Northern Manitoba, only those districts have been mentioned in which prospecting has led to actual mineral production. There are, however, several other areas of rocks similar to those at Schist lake and Herb lake and, with return of normal conditions and the impetus that will be given to prospecting by the inauguration of actual mining, it seems certain that other districts will receive attention. Geological conditions at other places are essentially similar to those in this belt, and it seems not unlikely that sulphide lenses similar to those at Schist lake, and gold-bearing quartz veins like those at Herb lake, will be found in some of the unprospected areas of Manitoba north of the Saskatchewan river.

BEAVER LAKE QUARTZ CLAIMS

Amisk lake, locally known as Beaver lake, lies to the westerly extreme of the new mineral belt, and was the scene of the first activity of a mining nature in this area. The lake is about 25 miles in length, north and south, and from 10 to 12 miles wide. The northerly end is studded with islands, of which Missi, or Grand, is the largest, being some 5 or 6 miles in diameter. In all, the lake contains about 1,000 islands, varying in size from mere bare rocks to the large Missi island. It lies wholly within the province of Saskatchewan, and is reached by the 18-mile wagon road from Shining bay on Namew lake. Canoes may

also be taken up the Sturgeon river from Sturgeon Landing, but this route is difficult, being about 25 miles in length and encountering several rapids and considerable shallow water. A winter trail takes a short cut across country to Cumberland House. At the lower end of the lake there is located a small settlement with a post office known as "Beaver Landing."

The chief discoveries, however, have been made at the north and north-westerly edge of the lake. Here much gold-bearing quartz has been discovered, the principal rush taking place in 1912. Over 1,500 claims have been staked on this lake, but only a few have been prospected or developed to any extent. The principal properties at present are those held by the Beaver Lake Gold Mining and Development Company, Limited, of Prince Albert, the E. B. Nagle Mining Company, Limited, of Ottawa, Graham Bros. and Messrs. Davenport, McDougall and McDonald.

The Beaver Lake Gold Mining and Development Company, Limited, were the first to go into extensive work in this region. They have acquired a group of thirty-three claims known as the "Prince Albert" group. These are located on the northwest end of the lake. They have all been surveyed and advertised, and five claims have had completed their assessment work. The company have spent \$30,555 on their claims, they have erected a complete set of camp buildings on the ground and have sunk a shaft on the Prince Albert claim to a depth of 76 feet, following a vein of very rich free-milling ore. They have on the ground a complete outfit of machinery to erect a milling and cyanide plant. The machinery consists of two 40-horsepower boilers, engines, hoisting plant, compressors, ore crusher, drills, and pumps. It was their intention to sink the shaft to the 100-foot level and then drift on the vein. Prospecting work done on many of their other claims has revealed extensive veins of similar gold quartz, all carrying high assays, from \$14 to \$40 a ton. Unforeseen conditions caused by the war have halted operations for a time, but the company have expressed their intention of resuming work when conditions become more normal, and are very optimistic regarding the outlook of their mining venture.

The E. B. Nagle Mining Company, Limited, hold a group of about ten claims on Magdalen lake, 4 miles north of Amisk lake, which they have had surveyed. Considerable development work has been done showing extensive bodies of quartz, but no mining has yet been undertaken.

Graham Bros. have a group of ten claims to the north of the lake, which are showing remarkable prospects. Many rumours were in circulation last year to the effect that their claims had been sold for \$150,000, but the reports have not been verified.

Various other claims have shown remarkably high assays, but sufficient work has not yet been done to determine the extent of the ore lens. With more extensive prospecting it is hoped that this lake will prove a profitable field in free-milling gold quartz.

FLIN-FLON LAKE SULPHIDE PROPERTY

This property, now known as "The Great Sulphides, comprises a group of ten claims located on the southeast shore of Flin-Flon lake. The original discovery was made in August of 1915 by Thomas Creighton, a veteran prospector then out in the interests of the Hammil-Currie-Foster Syndicate of Toronto. Dan Mosher, of Prince Albert, one of the original discoverers of the Beaver lake quartz veins, and four other prospectors are associated with Creighton in the staking of this property. Investigation quickly indicated the find to be very extensive, and arrangements were made for thorough tests. During the year 1916 about \$50,000 was spent in diamond drilling. Some eighteen holes were put down, comprising over 6,000 feet of drilling. The exact results of this drilling were not made public, but it is generally believed that about 3,000,000 tons of sulphide ore were proved up, and that the values ran about \$10 a ton in copper, gold, and silver.

Early in 1917 the property was taken over by a Toronto syndicate, the amount involved being generally reported as \$4,000,000. The syndicate lost no time in resuming drilling, two diamond drills being continuously operated during the past year. Another has recently been taken in and is now in operation. Full information of the results of the season's drilling is not available, but there is reliable information to the effect that over 20,000,000 tons of ore have been proven up. Trenching and cross-trenching show the ore body to be about 2,000 feet long and varying in width up to 300 feet. It is chiefly a solid mass, and is therefore one of the most stupenduous bodies of ore on the continent. Development of this property must necessarily be on a huge scale, involving such undertakings as building a railroad into the property, erection of a smelter, development and transmission of electric energy, and other gigantic undertakings. It is therefore evident that production from this district will not take place for some time. Just what action the syndicate propose taking is not known, but in the meantime they have established permanent camps for their staff at the property.

SCHIST LAKE COPPER MINES

The "Mandy" mineral claim, situated on the centre arm of Schist lake and lying about 4 miles southeast of the "Great Sulphides," holds the enviable record of being the first claim to undertake commercial shipments of ore from Manitoba. This claim has a most interesting and unique history. It was staked by F. C. Jackson in October, 1915. In company with S. S. Reynolds, he was on his first prospecting tour when they chanced on an outcrop of the copper ore. Samples of the ore discovered were shown to Mr. J. E. Spurr, an eminent geologist and Vice-president of the Tonopah Mining Company, who happened to be in the district examining other properties. An arrangement was made by which the Tonopah Mining Company took over the property on a percentage basis, and the Mandy Mining Company was forthwith formed as a subsidiary for the purpose of prospecting and developing the claim.

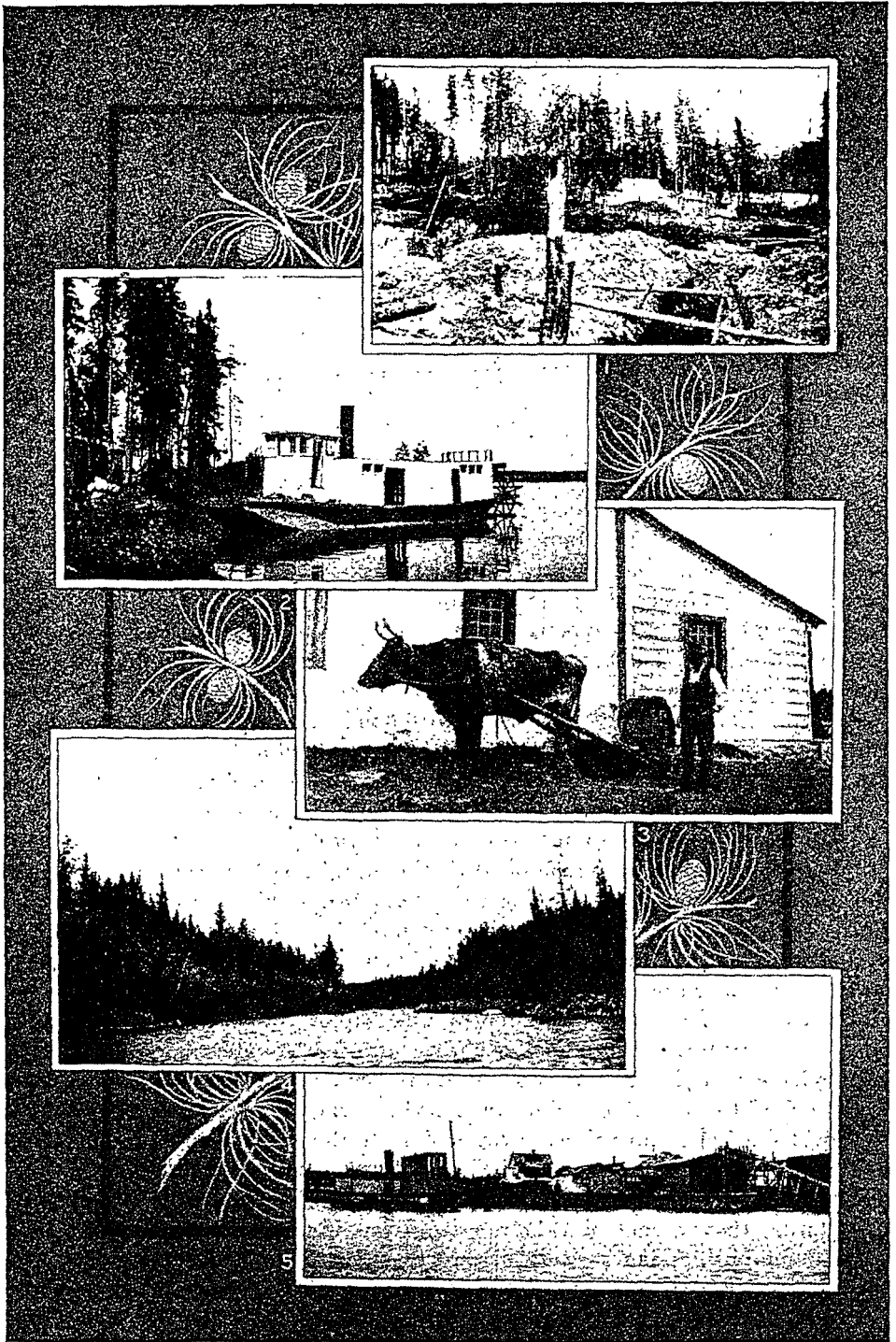
Work was got under way with all despatch. During the summer of 1916 camps were erected and about \$40,000 was spent in surface trenching and diamond drilling. Over 100,000 tons of ore were proved up in the lens. This ore consists of zinc blende and copper sulphide, the latter assaying 20 per cent copper, with traces of gold.

It was then decided to ship a quantity of copper ore to the smelter—the nearest one being at Trail, B.C. The first step was to mine the ore, which was done in primitive fashion. The equipment consisted merely of a boiler, two steam drills, and a derrick worked by horse-power. At the end of the winter season, 3,615 tons had been taken out. The next step was the hauling of this ore as recovered from the mine to the head of steamboat navigation at Sturgeon Landing on Namew lake. It was first necessary to put in shape a winter road, 36¾ miles in length, through a rough and unoccupied country in the depth of a severe winter, and to erect and equip a set of camps along the route to accommodate a gang of 110 men and 92 teams that were to engage in the business of ore hauling. This was accomplished in two weeks' time by taking advantage of the work done by the Manitoba Government in cutting out and clearing a roadway from Sturgeon Landing to Athapapuskow lake.

The entire output of 3,615 tons of ore was hauled through to Sturgeon Landing, and about 400 tons were taken right through to The Pas, a distance of about 90 miles. The balance was transported on barges by the Ross Navigation Company during the following summer. The average load carried by these barges was 100 tons, and they were easily handled by small steam river tugs. The ore was then hauled by team from the barge landing to the railway siding a half mile distant, loaded on cars and shipped to the smelter. It is therefore evident that to stand this style of mining and transportation and yet pay handsome returns the ore must be exceedingly rich.

During the summer season of 1917 the Manitoba Government completed their road from Sturgeon Landing to Athapapuskow lake, thus greatly facilitating the getting in of supplies to the camp. The Mandy Company hauled in and successfully launched on Athapapuskow lake a 52-foot tug. They also built and launched on Schist lake a 10-ton stern wheel steamer, as well as four 40-ton barges. This marine equipment was employed in transporting supplies and machinery to the camp and freighting out ore. A caterpillar tractor, with a capacity for hauling 20 tons, was put on the new road. The Ross Navigation Company added an additional steamer and several barges to their fleet, and a spur will be built from the railway siding to the water's edge at The Pas. Loading and unloading chutes and bins have been built at points of transshipment, so that the transportation problem has been considerably improved.

During the summer of 1917 the camp was improved and enlarged. The original mining appliances were discarded and a modern outfit installed. A power-house was erected and equipped with a 125-horsepower boiler, engine, 7-drill compressor, and hoist. A shaft was sunk to the 100-foot level, and drifting was commenced. A portable saw-mill was installed at the head of Schist lake, to cut the lumber required in these operations. In short, the camp took



1. The original post of the "Mandy" claim.
2. Small steamboat on Schist Lake.
3. Water carrier Hudson's Bay Company Cumberland House.
4. Schist Creek entering Athapapuskow Lake.
5. Scene on waterfront at "The Pas."

on quite a business-like air. About fifty-five men were employed in various capacities in connection with these works. Arrangements were made to sink to the 200-foot level, during the winter of 1917-18, so that ore might be broken at two levels. A contract was signed for the hauling to Sturgeon Landing of a minimum of 7,500 tons of ore, over double the amount handled last winter. The result of the winter's work has been most gratifying. Some 9,000 tons of ore were taken out and transported to Sturgeon Landing, and mining on the two levels is in progress.

While this primitive and limited method of transportation admits of profitably mining the wonderfully rich ore, it is too difficult to enable the mining of the lower grade chalcopryite and the zinc blende that occurs with the higher grade chalcopryite. Were railway transportation to be provided for this field the output of the Mandy could be tremendously increased and the profits enhanced in proportion to the reduction of the abnormally high transportation expenses at present prevailing.

Prospecting is being carried on in hopes of finding new lenses in the vicinity and it is reported encouraging indications have been encountered. The success attained in establishing a permanent camp here has had a wonderful effect in encouraging the prospecting of this district.

WEKUSKO LAKE GOLD MINES

Wekusko, or "Herb" lake, as it is locally known, is a very beautiful expanse of water about ten miles in length and studded with many picturesque islands. It lies at the eastern end of the mineral region now attracting attention, and while later in coming into prominence is already outstripping other quartz sections of the district. It is now easily reached by way of the new Manitoba Government road from mile 82 of the Hudson Bay railway. Like the Beaver Lake district on the western end of this mineral region, this lake is a gold-bearing section, veins of gold quartz being found along its eastern shore. The entire locality has been staked, and on several claims considerable work has been done, a few mines having been actually created.

The Rex group are probably the best-known claims on the lake. They comprise seven adjoining claims, most of which were located by Messrs. Campbell, Hassett, and Moore, and are now owned by the McKeever Bros. of New York. Operations are under the direction of their engineer, Mr. Walter Neal. A mill, power plant, hoists, drills, pumps, and other mining equipment has been installed, also a saw-mill and set of permanent camp buildings. A shaft has been sunk 120 feet and drifting commenced, and a second shaft has been started. The vein has been surface-traced for over 1,200 feet, with an average width of 5 feet. The values are reported very high. Other veins have been traced in all claims of the group, so that the future of this concern is felt to be very enticing.

The "Moosehorn" claim has the distinction of being the first producer of gold, and divides honours with the copper claim "Mandy." This claim is

owned by the Northern Manitoba Mining and Development Company, a local concern of The Pas business and mining men. A camp was established on this claim, a power-house erected and equipped with a 50-horsepower boiler, 5-drill air compressor, drills, hoists, pumps, and other equipment and work straightway commenced in sinking a shaft. The ore recovered in the sinking of this shaft was found to show high assays so it was decided to ship out a trial mill run to the smelter at Trail, B.C. Accordingly, a shipment of 57,000 pounds of this gold bearing quartz was hauled out with considerable difficulty and shipped. It yielded \$2,323.60 in gold, an average of \$81.53 per ton, a remarkable showing indeed. The shaft has been sunk deeper, and drifting will be started at the 100-foot level. The vein has widened from 15 inches to 2 feet, and the values are keeping up.

The Kiski-Wekusko claims lie south of the Moosehorn. A vein, with an average width of 3 feet 6 inches, has been traced for some distance and a shaft is now being sunk on it. This ore is well mineralized with arseno-pyrite, chalcopyrite, and free gold, which is often visible to the naked eye. Camps and machinery have been provided, and prospecting is being thoroughly carried out. These claims now belong to a Toronto syndicate headed by D. McLaren, a well-known capitalist. Work is in charge of J. P. Gordon, formerly Assistant Engineer, Hudson Bay Railway.

The Elizabeth-Dauphin claims comprise a group lying to the north of the Rex. They were prospected by "The Pas Consolidated Mines," with head offices in Winnipeg. The vein has an average width of 4 feet, and has been traced over 1,000 feet. A shaft is now being sunk and further development carried on.

The McCafferty claims lie well to the northeast of the lake, and comprise a very promising group. The vein had been traced last summer over 1,200 feet, and the values ran high. Since then camps have been established, and a shaft is now being sunk.

The "Syndicate" claims, directly across the lake from the Rex, show considerable free gold and are looked upon as likely producers. A shaft has already been sunk to a depth of 50 feet.

The Bingo, just north of the Rex, has a very narrow vein which showed the wonderfully rich assay of \$380 a ton. Many other claims show promise of strong veins and high values, but these mentioned include the principal ones on which work to any extent has been done. It is expected that rapid development will follow in this quarter.

WATER-POWERS*

Owing to its remoteness from any regular line of transportation, it was soon realized that if mining operations were to be successful in the new Mineral Belt a supply of hydro-electric power, sufficient to meet all possible demands, was

*Data for the section on water-power was compiled by Mr. C. H. Atwood of the Dominion Water Power Branch, Chief Engineer in charge of the Alberta and Saskatchewan power surveys.

one of the most important requirements of the district. This being the case, engineers of the Dominion Water Power Branch of the Department of the Interior were directed to investigate the district, and during the summers of 1915 and 1916 made reconnaissance power surveys of the Grass and Burntwood rivers to the east and of the Sturgeon-Weir and Churchill rivers to the west and north. The results of these investigations showed that the power sites lying in closest proximity to the Mineral Belt and capable of producing large quantities of power (blocks of 5,000-horsepower and over) were Birch rapids on the Sturgeon-Weir river and Island falls and Bloodstone falls on the Churchill river.

At this time, owing to the lack of stream flow records, no reliable estimate can be made of the continuous power output of these sites. The discharge measurements obtained during the power investigations are the only records available to date (January, 1918). However, the department, realizing the need of winter records, has despatched an officer of the Irrigation Branch to secure as many discharge measurements as possible this winter on the Sturgeon-Weir and Churchill rivers. These measurements, while not sufficient, will nevertheless provide data from which an approximate estimate of the continuous power available on these two rivers can be made.

The lack of information makes it difficult, at the present time, to summarize the water-power prospects in this district in a satisfactory manner but, in order to render the general situation more clear, a brief outline of the power possibilities on the individual rivers investigated is appended. The power estimates are subject to revision as further data become available.

The Burn wood River

The power investigation on this river covered the reach from Split lake up to Gate rapids, a distance of 140 miles. The river flows, generally without apparent current, through a well-defined valley, and for the most part the banks are of clay. The channel is wide, often expanding to lake dimensions, and sand bars or flats are not uncommon.

In the reach between Split lake and Three Point lake there is a total drop of 237 feet, concentrated for the most part at six falls and ten rapids. The most important power possibilities investigated were: Manaza falls, with an almost vertical drop of 26 feet; Jackpine falls, with a drop of 29 feet; Taskinip falls, with a descent of 53 feet; and Wuskwatim falls, with a total descent of 23 feet. The two latter falls are located only one-half mile apart and might well be combined in one power scheme. Wuskwatim lake affords a large storage capacity, and is conveniently situated.

Discharge records were obtained during the survey, and from these it is estimated that the minimum flow is approximately 500 second-feet, and that for nine months possibly 750 second-feet can be obtained. The power available,

as shown in the following table, is based upon this estimated flow and the head given at the sites, assuming a turbine efficiency of 80 per cent.

Power Site	Head in feet.	Discharge in second-feet.		Horse- power.		Remarks.
		Mini- mum	Depend- able for 9 months	Mini- mum	For 9 months	
Manaza Falls.....	26	500	750	1,182	1,800	Combined falls with- out storage
Jackpine Falls.....	29	500	750	1,318	2,000	
Taskinigup Falls	53	500	750	3,455	5,200	
Wuskwatim Falls	23					

The Grass River

Grass river forms a part of the great Nelson River drainage system and lies entirely within the province of Manitoba. From its source in the Cranberry lakes, near the Saskatchewan-Manitoba boundary, the Grass river flows in a northeasterly direction for about 275 miles before joining the Nelson, a few miles above Split lake.

The drainage basin comprises an area of approximately 6,400 square miles, and the general relief of the whole district is low and unpronounced. The rock is of Laurentian formation, but in many sections is overlain with considerable depths of clay or drift, and is claimed to be very suitable for agricultural settlement. The entire basin is more or less wooded with spruce, poplar, and pine, very little of which is of sufficient size for building purposes, though the spruce and poplar is large enough for pulp manufacture.

The river passes through many lake expanses, several of which should afford satisfactory storage. Wekusko lake with an area of 70 square miles, Sandy lake with an area of 12 square miles, Setting lake and adjoining lakes with a combined area of 85 square miles, can all be utilized and would provide a fairly complete regulation of the water supply.

The investigations covered that portion of the river lying between Reed lake and Split lake, or approximately 250 miles. In this reach there is an aggregate drop of 365 feet, occurring mainly at twenty-four rapids and nine falls. It is not economically possible to utilize this entire drop for power purposes, but at six sites it would be possible to concentrate 270 feet. The following table gives the location of these six sites, estimated minimum flow, available head, and the power output at 80 per cent turbine efficiency. Owing to the insufficient data relating to run-off, no attempt has been made to estimate the power output with proper storage regulation. It is apparent, nevertheless, that with the large drainage area, the mean discharge should be considerable and that power

development at any of the sites along the river will be greatly improved by the utilization of the storage opportunities.

Power Site	Head in feet	Discharge in c.f.s.		Horse-power		Remarks.
		Estimated minimum	Dependable for 9 months	Minimum	For 9 months	
Wekusko Rapids.....	55	100	150	500	750	
Second Falls.....	42	150	225	570	905	
First Falls.....	37	175	265	590	900	
Lynx Falls.....	54	350	525	1,720	2,577	
Sandy Falls.....	46	350	525	1,465	2,200	
Fifth Rapids.....	36	400	600	1,310	2,000	
Total.....				6,155	9,332	

The Sturgeon-Weir River

The Sturgeon-Weir river drains the large system of waterways lying in northern Saskatchewan, including Deschambault, Wood, Pelican, and Mirond lakes, and empties into Amisk (Beaver) lake which lies about 60 miles north-west of The Pas, Manitoba. The river from Mirond lake to Beaver lake is approximately 50 miles in length, and from Beaver lake to Namew (Sturgeon) lake, locally known as the Sturgeon river, is an additional 27 miles.

Between Mirond lake and Beaver lake there is an aggregate drop of approximately 60 feet, occurring mainly at six rapids. Of these rapids there is only one at which it is possible to develop, economically, sufficient power for the probable power demands of the Northern Manitoba mineral belt. This power site is at Birch rapids, about 17 miles below the outlet of Mirond lake and some 35 miles distant from Flin-Flon lake. At Birch rapids there is a natural drop of 11 feet, the river narrows to a width of 150 feet, and both banks which are of granite and quite steep, rise to a height of 50 or 60 feet above the river. A head of 30 feet can easily be obtained at this point. The natural discharge of the river is insufficient to meet the possible requirements of the mining district, and it is only in conjunction with a complete system of storage and regulation, together with a possible diversion of Churchill waters at Frog portage, that 20,000 or 25,000 continuous horse-power can be made available at this site. Mirond, Pelican, Deschambault, and Burntwood lakes with a combined area of approximately 360 square miles will provide the bulk of the storage required.

The Churchill River

The Churchill River basin comprises the watershed lying immediately northward of the watershed of the Saskatchewan and Nelson rivers, and drains into Hudson bay. The total area of the basin is approximately 114,150 square miles, the axis being practically east and west, extending westward to the

height of land dividing it from the Athabaska. Innumerable lakes of varying size occur throughout the whole basin, and the river itself to within 80 miles of its mouth may be described as a chain of lakes linked up by short stretches in which rapids and falls occur.

Throughout its entire length the Churchill provides numerous power and storage sites which will warrant very careful investigation. Certain of these power sites may possibly play a most important part in the development of the new Mineral Belt of northern Manitoba and Saskatchewan. There are two power sites located within reasonable transmission distance of the mining district. These sites are Bloodstone falls, situated at the lower end of Sisipuk (Duck) lake approximately 17 miles east of, and Island falls, approximately 10 miles due west of, the Manitoba-Saskatchewan boundary.

At Bloodstone falls there is a natural drop of 10 feet, and a head of 20 feet can easily be obtained; this would create a pond of roughly 90 square miles. From the meagre discharge data available it appears that 27,300 continuous 24-hour horse-power can be developed without utilizing the storage available. For eight months of the year possibly 36,000 horse-power can be developed. This power site is distant about 80 miles, in a direct line, from the mining district.

At Island falls, approximately 60 miles in a direct line from the mining district, there is a natural drop of 17 feet, and a head of 36 feet can be created which, under conditions of natural flow, would possibly develop between 40,000 and 50,000 continuous 24-hour horse-power. For eight months of the year possibly 65,500 horse-power can be developed.

The following table briefly summarizes the present estimate of the power available adjacent to the mining district and is subject to revision as further data is received

Power Site	Head in feet	Estimated minimum discharge in c.f.s.	Horse- power, continuous 24-hour power	Distance* to mining district in miles	Remarks
<i>Burntwood River—</i>					
Manaza Falls.....	26	500	1,182	160	Combined falls with- out storage
Jackpine Falls.....	29	500	1,318	150	
Taskinigup Falls.....	53 } 76	500	3,455	135	
Wuskwatim Falls.....	23 }				
<i>Grass River—</i>					
Wekusko Rapids.....	55	100	500	70	
Second Falls.....	42	150	570	90	
First Falls.....	37	175	590	100	
Lynx Falls.....	54	350	1,720	135	
Sandy Falls.....	46	350	1,465	145	
Fifth Rapids.....	36	400	1,310	170	
<i>Sturgeon-Weir River—</i>					
Birch Rapids.....	30	7,000	20,000	35	Regulated flow with storage
<i>Churchill River—</i>					
Bloodstone Falls.....	20	15,000	27,300	80	
Island Falls.....	36	15,000	49,000	60	

*To the Northern end of Athapapuskow lake in a direct line.

FORESTS

The provinces of Manitoba, Saskatchewan, and Alberta are frequently styled the "Prairie Provinces." While possibly the prairies may be regarded as their outstanding feature, the term is rather misleading in that it suggests the greater area to be prairie, whereas these prairies, however extensive, occupy only a small percentage of the total area of the provinces. At least 75 per cent of the entire land surface of Manitoba is covered by forests. The entire central and northern parts of the province are still practically unbroken forests. The heaviest growth in Manitoba and Saskatchewan lies generally along the Saskatchewan river from Prince Albert to lake Winnipeg, and extending some miles to the north and south.

South of the Saskatchewan river some of the principal tracts of valuable timber have been set aside by the Dominion Government as "forest reserves." These generally occur on elevated ridges or plateaus. North of the Saskatchewan river, throughout the mining district of this region and extending almost to Hudson bay, the country may be described as wooded, till the "barren lands" and open shores of the bay are reached.

Though this forest area is very extensive, it does not represent a high average of value. The hardwoods and most valuable species of soft woods are missing, while the growth of prevailing trees is generally retarded. The principal trees of Northern Manitoba include only a few species, namely, spruce, white and black, poplar, tamarack, birch, and jack pine. Of these, the white spruce (*picea canadensis*) is practically the only durable species for saw-mill purposes. It grows to a fair size on high land surrounding the lakes averaging from 18 to 24 inches in diameter. Samples up to 36 inches diameter have been found on the shores of Reed lake. It generally grows tall and straight, up to 90 feet in height, and makes excellent lumber, pulp and paper. The black spruce (*picea mariana*) is a slower-growing tree and does not usually reach such a size as the white spruce. It is found in low swampy ground. Jack pine (*pinus Banksiana*), is found on nearly all dry sandy ridges. It is used extensively for ties. Tamarack (*larix laricina*) grows extensively throughout the district, and is used for poles, fences, ties, and fuel. The poplars, aspens or cottonwoods (*populus*), and the birches (*betula*) have not yet been found of much commercial importance, but are extensively used locally as fuel.

The greater part of Northern Manitoba was covered with a much heavier forest than that at present standing. This was nearly destroyed by disastrous fires many years ago. The present forests are principally second-growth—following such fire. Many regions, for instance the Burntwood River district, have not reforested.

The cut of timber in Manitoba has been comparatively small, in 1916 being less than one million dollars in value as compared with sixty-six millions for the whole of Canada. The Finger mill, located at The Pas, is one of the largest operating in the Prairie Provinces, the cut for 1917 being 15 million board-feet. This consisted entirely of spruce cut on timber berths along the Carrot river

within the boundaries of Saskatchewan. Three small portable saw-mills are in operation north of The Pas. The Hudson Bay Construction Company operate one at mile 185, for their own use. The Mandy Mining Company have one on Schist lake, while one has recently been installed on Wekusko lake in connection with the Rex mine. The annual cut of these three mills amounts to about half a million feet.

Great quantities of wood for the manufacture of pulp are available, and plans are being considered for the erection of a plant at Grand Rapids, where the Saskatchewan river enters lake Winnipeg. Water-power is available at this point, and the location is favourable for the transportation of wood to the site.

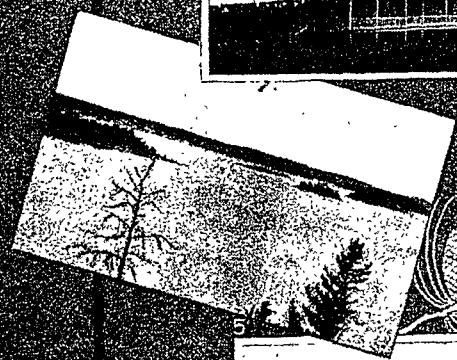
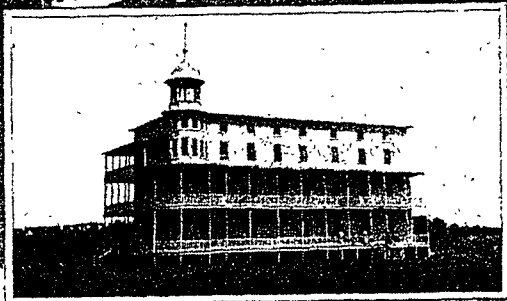
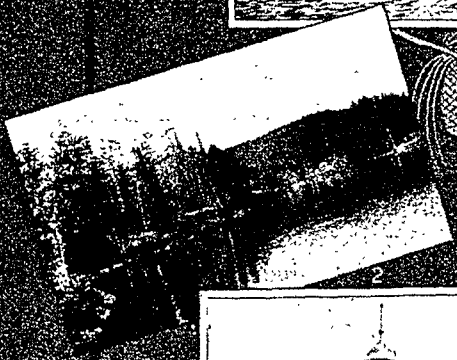
Other resources of these forest areas are the extensive bogs and swamps which occur in low-lying parts. While no steps have been taken to utilize them it is believed that they might be made to profitably yield vast quantities of peat. The production of either pulp or peat, however, has yet to be inaugurated, and more definite information must first be obtained with respect to the extent of the raw material available. It is reasonable, however, to expect that great possibilities are in store for industries along these lines.

As pointed out by the Director of Forestry in an address before the Canadian Forestry Association at Winnipeg in 1913, Manitoba may yet become a great forest province. The information in this connection given in the following paragraphs are obtained from this source.

Northern Manitoba offers an attractive field for the practice of commercial forestry. Several European countries, with similar conditions in respect to geological and climatic conditions have made great successes of such ventures, and are deriving handsome revenues from them. Investigations have shown that the rate of tree growth in Manitoba compares favourably with that in Germany France, and Sweden.

The case of Sweden might be cited as an indication of what could be hoped for in Manitoba by following a suitable forest policy. Sweden is a northern country having similar conditions of climate and soil, much of it being underlain by a granite formation like that of the Laurentian area. It is about equal in extent to Northern Manitoba, its total area being 172,876 square miles as compared with Northern Manitoba's area of 178,100 square miles.

By following a systematic forestry policy during recent years Sweden has placed the industry on a profitable basis, and is now receiving a national revenue and providing employment for thousands of her people, at the same time providing for replenishing the forest supply in proportion to the consumption. In 1905 her wood-working industries included 1,370 saw-mills, 138 pulp-mills and 20 match factories, giving employment to 56,424 people. The government forests themselves employed a staff of 971 rangers and officials, and yet yielded a net revenue of \$2,122,625. The total values of her forest products for the year were \$107,000 000. Comparing this with Manitoba's products of less than one million dollars but with natural conditions as favourable, it cannot but suggest the great opportunities that await the province in commercial forestry.



1. The original Flin-Flon camp.
2. Flin-Flon Lake.
3. Amisk Lake from Copper Portage.
4. Roman Catholic Hospital at The Pas.
5. View from high bank of Amisk Lake.
6. A choice camping spot.
7. Northeastly part of Amisk Lake.

FUR AND GAME

The history of the fur trade of Manitoba is so closely associated with the history of the Hudson's Bay Company that it naturally forms an essential part of the latter. Especially has this been true since the boundaries of the province were extended in 1912 to the shores of Hudson bay, to include a great stretch of foreshore of this vast inland ocean. On these shores the earliest trading posts of the Hudson's Bay Company were established, and within the enlarged boundaries of Manitoba two of the principal of these are now embraced, namely, Churchill and Nelson. For some 250 odd years the fur trade has flourished on these shores, and it still remains the most important industry of the district.

The discovery of Hudson's bay in 1610 by the great English navigator whose name it bears antedated by over half a century the first steps in establishing any actual trade, but opened the way for navigation which has been carried on in this bay for over three hundred years. The tragedy and mystery connected with this discovery make it doubly impressive. Sailing in search of a "northwest passage" by which it was hoped to find a short cut to China, Henry Hudson, with his small ship the *Discovery*, entered the straits in 1610, and steering southerly found himself winter bound at the extremity of the bay. He passed the winter of 1610-11 probably near the south shores of James bay, where hunger, cold, and sickness played havoc with his crew. The following summer mutiny broke out among the survivors, who cast Hudson adrift in a small boat with his little son, a faithful servant, and a number of sick shipmates, and sailed back to England in his vessel. After many hardships and losses the survivors of this mutinous crew reached home. The story of the voyage was extracted from them, and punishment was meted out to the guilty. Steps were taken to rescue their victims, but no trace or word of the unfortunate outcasts was ever obtained, and their fate has remained a mystery to this day.

The first expedition to search for the gallant Hudson was commanded by Admiral Sir Thomas Button who sailed into the bay in 1612 and spent the winter of 1612-13 with his ship moored at the mouth of a large river which he had discovered. His crew also suffered great hardships and losses from the severities of the climate. Among others, his mate, named Nelson, died, and Button named the river in honour of him, Nelson river.

Earliest records of Churchill appear to date back to 1619-20 when a Danish navigator, Jens Munck, with two small ships and thirty-five men, in search still of a "northwest passage", found themselves winter bound on the west shore of Hudson bay in a harbour they called "Munck's Cove" which has since been shown to be identical with Churchill. Here they suffered most distressing hardships from the rigors of the winter for which they were unprepared. Only three men survived, and with great difficulty reached home the following summer with the smaller of the two ships.

For fifty years following these events there appears no record of any activity on the bay. The next news, however, is from an overland source, when in 1663

a French-Canadian adventurer, Radisson, arrived in Quebec from Hudson bay by way of lake Superior, with a cargo of 60,000 beaver skins, worth then half a million dollars.

Falling into disfavour with the French officials, his wealth was confiscated, but he carried his reports to England where he was financed by a number of nobles, including Prince Rupert, in making a trial voyage by sea to Hudson bay in quest of additional fur. This voyage was made in 1668 and the return in 1669 with such success that it led to the formation of "The Company of Gentlemen Adventurers of England trading into Hudson's Bay" to whom a royal charter of incorporation was granted in 1670 by King Charles II.

The first governor of the company was Prince Rupert, and the first posts established were "Prince Rupert," "Moose Factory," and "Fort Albany," all on James bay. Three ships were commissioned in 1670, namely, the *Wavero*, the *Shaftsbury*, and the *Prince Rupert*. Trading at Nelson followed closely upon the establishing of the commerce, posts being variously known as Port Nelson and York Factory. Records of 1679 show that the fur trade consisted of 10,500 beaver, 1,100 marten, 200 otter, 700 elk (probably caribou), and great numbers of ermine, muskrat, and coarser fur. Trade commenced at Churchill in 1660, the site being named by Captain Abraham in honour of the Duke of Marlborough.

The histories of these posts make thrilling reading. Added to the perils of navigation, the rigours of northern climate, and the opposition of rival traders—which at times amounted to open warfare—were the hostile raids of French vessels who long disputed the claim of the English to this district. Posts were fortified and garrisoned all in vain. Port Nelson was captured as early as 1682, but restored a few years later. At Churchill stone bastions were built in 1718, and during the years 1733–47 Fort Prince of Wales was erected, a veritable stronghold in those days. However, in spite of stone walls and cannon, both Churchill and Nelson were captured in 1782 (one hundred years after the first fall of Nelson) by the French admiral, LaPerouse, who sailed his ships of war into the bay and swept it from north to south. The fortifications were destroyed before the posts were restored to the company.

Inland rival companies were capturing the trade in spite of the claims of the company to a monopoly under their charter. A trading post was established by French traders at The Pas as early as 1750, and to offset this, in 1773, the Hudson's Bay Company established the post "Cumberland House" on Cumberland lake, within the present boundaries of the province of Saskatchewan. For over a century this post was an important inland metropolis of trade and travel, and is still an active center of trade. The greatest opposition met from rival companies was that from the "North-West Company," founded in Montreal in 1795, a powerful company which threatened the very existence of its rival. So keen did the rivalry become, leading into much bloodshed, that only by terms being reached were either company saved from financial ruin. With cessation of hostilities between the English and French nations the company was relieved of fears from the French naval raids. In 1821 an alliance was made with the

old enemy, the North West Company. The rivals merged forces and continued under the name of the older, the Hudson's Bay Company.

In 1870, exactly 200 years after the granting of the charter, the Dominion of Canada acquired by purchase all the company's claims to "Prince Rupert's Land," thus ending the disputes in that connection. Since that time the affairs of the company have run more smoothly, and while many other fur buyers have invaded the field and competition has been keen it has been marked by no act of violence.

The principal ports of the Hudson's Bay Company throughout this district now in active operation are Churchill, York Factory, Oxford House, Norway House, Nelson House, The Pas, and Cumberland House. Many smaller outposts are scattered throughout the territory, carrying on in primitive fashion the trade commenced in early days.

An estimate made by Commissioner Campbell of Northern Manitoba of the fur catch in his district during the winter of 1916-17 places the value at one million dollars. Of this one-half million dollars worth of fur passed through The Pas, being shipped out by rail. The balance is divided between Norway House, which now ships by boat to Winnipeg, and York Factory, which ships direct to England.

All the principal northern fur-bearing animals abound, while among the larger game are moose and barren-land and woodland caribou. The numerous lakes of the district are the breeding places in summer of countless flocks of wild water fowl of all descriptions common to these latitudes. Ducks, geese, and swans are found in great abundance. Among the land game birds such varieties are found as grouse, ptarmigan, and snipe.

This vast district with its rugged and broken surface, its forests and streams and its rigour of climate, presenting a forbidding aspect to the human race, proves nevertheless an ideal game preserve and a source of continued wealth to the community. After 250 years of toll it still produces a million dollars' worth of fur yearly.

With judicious control of the trapping of fur-bearing animals and the shooting of game, together with such restrictions when necessary as will prevent the extermination of any species, this heritage of wealth should continue as a permanent resource of the country.

FISH

The province of Manitoba and the northern part of the province of Saskatchewan offer great possibilities in the matter of fish supply. The network of lakes and rivers extending over these areas forms an enormous field for inland fisheries. The waters are usually deep and clear, with rapid streams flowing from lake to lake, keeping a constant circulation and preventing stagnation. In addition, the northern climate keeps the waters cold throughout most of the year, while the spruce forests add to the attraction by their cool shade, and the myriads of insect life they breed form abundant fish food. Generally speaking,

the conditions are very favourable for producing an excellent quality of fresh water fish.

The principal yields to date have been from lake Winnipeg, where large numbers of Icelandic fishermen follow their favourite occupation. A fleet of fishing vessels plies the lake during the season of navigation, from Selkirk to Norway House, while considerable winter fishing is also carried on. As adequate transportation facilities from Selkirk to Winnipeg are provided, and the distance is but 16 miles, the products of the lake find a ready market in this city.

The northern lakes team with fish, but lack of transportation has prevented the full value of these lakes being harvested as yet. The construction of the Hudson Bay railway has given a great impetus to the industry along its route, and the opening of better roads into the mines has also provided an outlet for other lakes. The mines themselves consume a limited supply on the ground.

The industry in these northern lakes of the provinces is chiefly carried on in the winter time, the fish being caught in nets placed below the ice. Freezing as soon as taken from the water, they are packed in wooden boxes and sent in a frozen condition direct to the dealer. Carload lots of these are regularly shipped to various points in Canada and the United States, and find a ready market. In fact, fried whitefish, secured from this source, has long since gained fame as a most delightful dish. As winter travel in these northern regions is chiefly by dog team, great quantities of fish are required to feed these animals. For this purpose the coarser varieties, including suckers, which are very abundant, are used. Summer fishing for sturgeon has been carried on with considerable success in some of these lakes.

The following table shows the varieties of fish and the total catch in the province of Manitoba during the year ending March 31, 1917:—

FISH AND FISH PRODUCTS*

Manitoba, Year of 1916-17

Kind.	Quantity.	Value
	Cwt.	\$
Trout.....	1,259	8,813
Sturgeon.....	1,819	20,506
Whitefish.....	50,539	350,543
Pickarel.....	45,298	311,262
Perch.....	8,603	43,015
Pike.....	41,289	204,749
Tullibee.....	49,185	245,925
Catfish.....	1,085	6,510
Goldeyes.....	6,466	31,610
Mulletts.....	10,802	21,604
Mixed fish.....	71,595	143,190
Caviare.....lbs.	2,300	2,275
Total value.....		\$ 1,390,002

* Fisheries Branch, Department of the Naval Service.

Of this total value, about \$200,000 represents the catch of Northern Manitoba, which was shipped through The Pas. The catch from Amisk (Beaver) lake, Saskatchewan, is included in this amount, but nothing from the north shore of lake Winnipeg or from Hudson bay, which form part of Northern Manitoba's field. The choicest varieties of these fish are the trout, whitefish, and pickerel. For these the fishermen received during the winter of 1917-18 the sum of 7½ cents per pound. Fish used for home consumption, and the coarse varieties used as dog feed, are not included in these figures. With the completion of the Hudson Bay railway, giving direct connection from The Pas to Port Nelson, the province will have more direct interest in the salt water fisheries of Hudson bay. The boundaries of the province include over 400 miles of its shore line and the two principal ports of Churchill and Nelson. The Hudson's Bay Company have for some time maintained a whaling station at Churchill.

Particulars as to the amount and value of equipment used in fishing operations, and the number of persons employed in this industry, in Manitoba, during the year 1916-17 are shown in the following table:—

MANITOBA FISH INDUSTRY, 1916-17**

Equipment	Number	Value \$
Steam vessels or tugs.....	11	142,000
Boats, sail.....	659	30,135
Boats, gasoline.....	1	800
Gill-nets, seines and other nets.....	20,145	144,699
Lines.....	50	100
Freezers and ice houses.....	60	65,750
Smoke and fish houses.....	73	12,000
Piers and wharves.....	18	12,450
Total value.....		\$ 407,934

Employment of Men	Number
In Vessels or Tugs.....	119
In boats.....	874
In winter fishing.....	735
In fish houses, freezers, etc.....	321
Total.....	2,049

* Fisheries Branch, Department of the Naval Service.

Fish culture is being prosecuted by the Dominion Government at various points throughout the district with great success, and fresh stock from these sources is being continually added to the lakes to prevent the depletion of this valuable resource. Whitefish and pickerel are the varieties produced, and the distribution is shown in the following table:—

FISH DISTRIBUTION, 1916*
Manitoba and Saskatchewan.

Hatchery	Fry Distributed	Number
Selkirk.....	Whitefish.....	35,500,000
Gull Harbour.....	Whitefish.....	50,000,000
Dauphin river.....	Pickarel.....	16,000,000
Winneposis.....	Whitefish.....	80,000,000
Fort Qu'Appelle.....	Whitefish.....	85,000,000
	Whitefish.....	15,920,000
Total.....		282,420,000

* Fisheries Branch, Department of the Naval Service.

The fisheries of the province are a federal resource and are administered by the Fisheries Branch, Department of the Naval Service, Ottawa. Local inspectors are placed in charge of various districts to carry out the regulations of the branch. Northern Manitoba falls within district No. 2 of the province, and embraces a subdivision known as "The Pas District," the local officer in charge of which is stationed at the town of The Pas. Commercial fishing is regulated to certain set seasons and, subject to certain conditions and can only be proceeded with under license which must be obtained from the officers of the Fisheries Branch.

The fishing resources of these northern waters are enormous, and the food values are said, on good authority, to be higher in proportion to their extent than any other inland fisheries in the world. The commercial importance of these resources, with a world shortage of food threatening, can readily be realized. The development of a profitable and permanent fishing industry will no doubt be instituted in this district.

CLIMATE AND AGRICULTURAL POSSIBILITIES

Climatic conditions in Northern Manitoba are more favourable than would appear at first glance. The rugged nature of the surface of the country, its numerous lakes and mantle of forest tend to suggest an undue severity in a writer's aspect. Especially is this noticeable in an uninhabited or sparsely settled district. Earliest explorers in the regions where now stand Quebec and Montreal reported most harrowing tales of the severity of our winters. In all probability the reports of the severity of the Hudson Bay and Northern Manitoba regions contain about the same degree of frightfulness. "Our Lady of the Snows" may appear unapproachable to those who lack courage, but her climate is most agreeable to the sturdy race she rears.

A brief visit to the district, at any time of the year, is all that is required to dispel any illusions of northern wastes that might have been associated therewith. The summer vegetation is most luxuriant and beautiful, and the trees of the forest bear evidence the year round of climatic conditions favourable to

their growth. Spruce has been found on Reed lake with diameters of three feet, and tall, straight trunks, perfect samples of their species.

Hudson bay is open the year round, but navigation is limited owing to the freezing of Hudson strait and the harbours along the coast, as well as to the dangers of drifting ice floes. It is expected, however, that for at least three months of the year the route will be perfectly satisfactory. During a period of nearly two hundred years the Hudson's Bay Company sailed some seven hundred and fifty vessels between the bay and England in carrying on their fur trade. These ranged from 70-gun ships to 10-ton pinnaces, all sailing vessels, and only two were lost. Officers of the company stationed at Churchill and Nelson have from time to time reported upon the success of their vegetable and flower gardens. They describe the transition from winter to summer as being very rapid, and the growth of all vegetable matter during the latter period as marvellous.

During the winter of 1916-17 some two hundred teams of horses were engaged in hauling ore from the Mandy mine on Schist lake, as well as others hauling fish, and the work was carried on without interruption from weather conditions.

Examination of meteorological records obtained at The Pas indicate climatic conditions as favourable as at Prince Albert, Edmonton, and other points now the centres of extensive agricultural sections. As the land lying along the Saskatchewan river is fertile, and the soil deep, it would appear that when proper drainage is provided an extensive area of good farming land will be available, which will extend north to the outcropping of the limestone formation. The following table has been compiled from the records of the Meteorological Service of Canada:—

THE PAS, 1916*

Month	Temperature			Precipitation Inches
	Highest	Lowest	Average	
January.....	21°	-51°	-16°	0.23
February.....	48	-44	-2	0.16
March.....	46	-30	8	0.79
April.....	69	-12	33	0.20
May.....	66	17	44	5.40
June.....	78	32	56	1.96
July.....	87	52	69	1.39
August.....	86	38	62	3.20
September.....	72	29	50	2.02
October.....	56	15	33	1.49
November.....	44	-3	22	0.82
December.....	41	-34	-5	0.20
Total.....				17.86

* Meteorological Service of Canada.

Another extensive clay belt is found along the Hudson Bay railway about midway from The Pas to Nelson. It is lightly wooded, fairly level, well drained and, judging by experiments made at various points along the railway, is suitable

for mixed farming. Its close proximity to the line of steel makes it an attractive field to the homesteader who finds the transportation problem difficult in other locations.

Much land suitable for agriculture is found along the Nelson and Burntwood rivers and about Split lake. Fertile valleys and clay belts are found as far north as Churchill river. In many of the narrow valleys through which streams run from lake to lake are found flats of rich alluvial soil covered by a most profuse growth of grass and wild hay. While such areas are limited and impracticable as agricultural sections purely, they offer splendid inducements as supply farms to mining camps, when adjacent to such. With the expansion of the mining industry, such opportunities will become more numerous.

Taken the year round the climate is agreeable, healthy, and bracing. The snowfall in winter is light and the temperature fairly uniform. The summers are delightful, with their long days and exhilarating air. The rapid growth of all vegetation assures success in agricultural lines on those areas covered by good soil. The opening up of the district by the mining activity will pave the way for settlement to follow. With the varied resources awaiting development, the pioneer of Northern Manitoba enjoys excellent opportunities.

SCENIC ATTRACTIONS

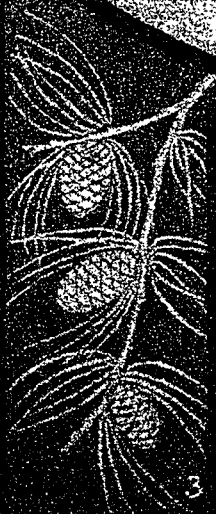
Apart from the economic value of this northern district there is the charm of its natural beauty. The great stretches of northern wilds, rugged and rocky, covered with virgin forests and interwoven with a network of endless lakes and rivers, dotted with countless islands, present a limitless field for the tourist who seeks to avoid the crowded paths of travel. Here in the bracing northern summers, with their long days and cool twilight nights, are found the Elysian fields of the province. The grandeur of mountain districts is surpassed by the diversified nature of the scenery, and the ease of access to any desired point. It is particularly adapted to canoeing and camping expeditions, offering alike opportunities to limited or extended itineraries.

Ontario has its Muskoka which has been styled "The Highlands of Ontario", its Algonquin Park, its Thousand Islands of the St. Lawrence and other famous holiday districts, all noted for their natural beauty of scenery. Quebec has its Saguenay, New Brunswick its Restigouche, and Nova Scotia its Bras d'or Lake, whose praises have been chanted everywhere, but heretofore little has been known of the charms of Manitoba's camping ground. All the attractions of these better-known resorts are found here and in more extensive fields. Northern Manitoba and Saskatchewan are now within easy reach of the main centres of the West, and once their attractions are better known and appreciated will become very popular resorts. The physical characteristics of the western provinces make these northern regions the playgrounds of the prairies.

Canoeing finds an ideal and unlimited outlet here, in fact the canoe is the only means of travel throughout this district during the summer. Networks of lakes and streams form highways of travel throughout the entire north, and



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1. Indian Canoemen.

2. A Summer Day on Reed Lake.

3. Island Lake.

whole seasons may be spent in constant travel without duplications of sections visited. Ideal camping spots are always available. Islands and mainlands present sites varying from bare rock to thick woods. Camp fuel is supplied by the forests, as well as spruce boughs to rest on, and poles for camp construction are found in plenty. The only disadvantage is the annoyance, at certain periods, caused by insects, but these, while plentiful in the woods, can usually be avoided by choosing camp sites on bare points exposed to the breezes of the lakes. Wind and smoke are the enemies of these pests. Tents should be provided with netting, sleeping quarters requiring special protection.

Fish are found in abundance, and the disciple of Isaac Walton will find his Valhalla here. Game, both large and small, abound in plenty, and during open seasons provide the hunter with right royal sport. The lovers of nature, naturalists, botanists, and entomologists, find ample opportunity for study at close range, and the amateur photographer an endless field for the pursuit of his favourite pastime. The dark green of the spruce, the delicate beauty of the birch, and the dull red of the massive cliffs of granite in the background in contrast with the campers' white tents on the beach in the foreground, constitute a picture long to be cherished as a fond memory of such outings.

Moose, caribou, bear, beaver, lynx, fox, mink, otter, squirrel, and other furry denizens of the forest can be seen in their native haunts. Geese, ducks, loons, gulls, waxies, cormorants, and pelicans nest in great numbers on the shores of the lakes and on barren rocky islands, and their domestic habits are a source of endless delight to the naturalist. The familiar robin can be heard in the tree tops, while the saucy Canada jay soon becomes an intimate visitor of the camp. Hawks, owls, woodpeckers, and kingfishers are found in plenty while the chickadee and song sparrow flit about on every hand. The lingering call of the whip-poor-will echoes throughout the twilight night, interrupted by the weird cry of the loon. The furred and feathered friends of this wooded district form a never-ending field of interest and research.

Fruits and flowers also abound in plenty, and are a continual source of pleasure to the campers. Saskatoons, raspberries, strawberries, red and black currants, gooseberries, and cranberries are found in considerable quantity, and are of excellent quality. Wild roses bloom everywhere in great profusion. Tiger lilies blaze forth on the hillsides, while the delicate wild lily-of-the-valley and forget-me-not are found on the shores of nearly all lakes. Many of the more sluggish streams are full of water or pond lilies which bloom to perfection.

Nor are the attractions of the district confined to the summer season. The depths of the forest shout a wintry defiance to the summer intruder to try conclusions when King Frost reigns, and the thrill of conquest experienced by the man of nerve, who traverses these wastes by dog team and sleeps under the broad canopy of heaven, illuminated by the scintillating northern lights, exceeds even his summer adventures. He returns with new life, and scorns the indolent ease of a southern resort. In this region Manitoba has a Mecca for the tourist, a natural sanitarium for the invalid, and a recreation ground for all her people.

APPENDIX

1. Synopsis of Quartz Mining Regulations*

Quartz Mining.—Any person eighteen years of age or over, having discovered mineral in place, may locate a claim 1,500 feet by 1,500 feet by marking the same with three legal posts, one at each end of the lode or vein, and a third at the point where mineral in place has been discovered, and by opening a straight line joining Posts Nos. 1 and 2. The two location posts must have legibly marked thereon the name of the claim, the number of the post (that is, No. 1 or No. 2) the date of location, the name of the locator, and the number of feet lying to the left and to the right of the location line. No. 1 Post must be marked "Initial Post," and the post where discovery has been made must be marked "Discovery Post."

The claim shall be recorded within fifteen (15) days if located within ten (10) miles of a Mining Recorder's Office; one (1) additional day allowed for every additional ten (10) miles or fraction thereof. The fee for recording a claim is Five Dollars (\$5.00).

At least One Hundred Dollars (\$100.00) must be expended on the claim each year or paid to the Mining Recorder in lieu thereof. When Five Hundred Dollars (\$500.00) has been expended or paid, the locator may, upon having a survey made, and upon complying with other requirements, lease the land, and permission may be granted to group any number of adjoining claims up to eight (8) in number for representation work, upon taking out a certificate of partnership before the commencement of the work.

If any person satisfies the Recorder that he is about to undertake a bona fide prospecting trip and files a power of attorney from any number of persons not exceeding two (2) authorizing him to stake claims for them in consideration of their having enabled him to undertake the trip, he may stake one (1) claim in the name of each such person upon any lode or vein which he may discover.

2. Synopsis of Dominion Water-Power Regulations†

1. An applicant who contemplates the development of a water power must submit an application in writing, giving certain general specified information, including facts on both the engineering and financial aspects of the proposed undertaking.
2. Upon the consideration of such information the Department may, if it approves of the proposed project, enter into an agreement with the applicant for a power development.
3. No priority of right whatever is obtained by making a formal application. All pending applications are considered and a license may be issued to such applicant as the Department considers offers the best scheme.

*Mining Lands and Yukon Branch, Department of the Interior, Ottawa.

†Dominion Water Power Branch, Department of the Interior, Ottawa.

4. If, after investigation by the Department's engineers, an applicant's scheme is approved, a formal agreement may be made consisting of a license and lease which run concurrently for a period of twenty-one years, renewable for three additional periods of twenty-one years or eighty-four years in all, unless terminated earlier under the provisions of the regulations.
5. The agreement provides that the work must be diligently carried on according to the plans approved of, that actual construction work must be started within a certain time, that a minimum amount of money must be expended in each year of the life of the agreement on actual construction operations, and that a minimum amount of power, to be determined by the Department, must be developed within a period not to exceed five years.
6. Rentals are revisable at the end of each twenty-one year period, or the Government may, at such time, if deemed advisable, take over the works of the licensee upon payment therefor of an amount to be fixed by arbitrators.
7. The regulations require the development of power in keeping with the demand.
8. Provisions are made for the adjustment by the Canadian Railway Commission of rates and prices charged to the public for power.
9. The regulations provide that the Department may control the manner of diverting the waters authorized so as to promote the maximum advantageous development of the power resources of the river on which the site is located, and may, from time to time, order such improvements or enlargements in any scheme as are considered necessary to insure the proper development of available resources.

3. Synopsis of Timber Regulations*

Timber may be cut on vacant Dominion Lands in the Province of Manitoba either under license or under permit.

Berths under license are disposed of at public auction at the office of the Dominion Crown Timber Agent for the district in which the berth is situated. No berth of this character shall contain more than an area of twenty-five square miles. Before the berth is sold, it is surveyed and cruised by a competent official of the department, and is offered for sale at an upset price, after being advertized for at least sixty days. The licenses cover one year, but are renewable from year to year until the merchantable timber has been removed, provided the conditions are complied with. Timber of a less diameter than 10 inches at the stump is not covered by the license. The licensee is required to pay an annual ground rental of \$5 per square mile, one-half the cost of fire-guarding the timber on his berth, and royalty on all timber cut. The royalty on sawn lumber is 50 cents per thousand feet B.M.

*Timber and Grazing Branch, Department of the Interior, Ottawa.

Permits may be issued to owners of portable sawmills to cut lumber, shingles and lath on berths not exceeding one square mile in area. All permits are issued for one year and are renewable for the second year only. Ground rental is charged at the rate of \$100 per square mile per annum, in addition to royalty dues on all timber cut. These permits are issued only in districts where the settlers cannot secure lumber for their own use in the ordinary way. South of the Saskatchewan river all timber cut under these permits must be sold to settlers residing within a radius of fifty miles of the berth, but north of the river the products may be sold to settlers residing more than fifty miles from the berth, and to other than settlers on payment of dues at the rate of \$1.50 per thousand feet B.M. in the case of lumber. Settlers residing within fifty miles are charged 50 cents per thousand.

Permits may be granted to cut timber as cordwood, pulpwood, fence posts, telegraph poles, or for mining purposes on tracts of land not exceeding one-quarter of a square mile. The rental is \$25 per annum, in addition to certain royalty dues on all timber cut. These permits are renewable for the second year only.

Actual settlers and persons living in cities, towns and villages may obtain permits to cut up to 100 cords of wood for sale, on payment of dues at the rate of 25 cents per cord.

Homesteaders having no timber of their own may secure free permits to cut certain quantities of timber for use on their land.

Owners or operators of mines may secure permits to cut such timber as they may require in the development of their mines, on payment of dues of one-eighth cent per lineal foot for timber under 5 inches in diameter at the butt end, one-quarter cent for timber for 5 to 9 inches, and one-half cent for timber over 9 inches.

4. Synopsis of the Manitoba Game Laws

THE GAME PROTECTION ACT AND THE INSECTIVOROUS BIRDS ACT.

Protected at all Times

1. Elk or wapiti, prairie chicken, partridge, grouse and imported game birds.
2. Female deer and the fawns of any deer under one year of age.
3. Insectivorous and migratory non-game birds and their nests and eggs as set forth in "The Insectivorous Birds Act."
4. All animals and birds within the Provincial Game Preserves, comprising 13 in number and described in "The Game Protection Act."

Unlawful

1. Shooting or hunting on Sunday.
2. Shooting or hunting after sunset or before sunrise (except shooting wild geese or ducks from stubble fields).

3. Use of poison, nets, automatic guns, night lights, etc.
4. Allowing dogs at large in haunts of deer.
5. Shooting or hunting on any person's land without permission from the owner.
6. Shooting or hunting without a license (except resident farmers in the case of game birds only).

Chart of Seasons

OPEN SEASON—WHITE.	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
BAG LIMIT—Deer, etc., one male adult only. Ptarmigan, 15 a day, total 50 for season. Geese, 10 a day. Ducks, 20 a day during last fifteen days of September, 40 a day during remainder of open season. Penalties, \$10 00 to \$500 00 or imprisonment.												
One male only, Moose, Deer, Cabri or Antelope, Reindeer or Cariboo.											20 th NOV	1 st DEC
Otter or Beaver south of the fifty-third parallel of north latitude.												
Otter or Beaver north of the fifty-third parallel of north latitude.												
Fisher or Pekan, Sable, Marten or Mink south of the fifty-third parallel of north latitude.												
Mink, Marten, Fisher, Pekan or Sable north of the fifty-third parallel of north latitude.												
Fox or Lynx north of the fifty-third parallel of north latitude.												
Musk rats north of the fifty-first parallel of north latitude.					15 th MAY					20 th OCT		
Musk rats south of the fifty-first parallel of north latitude.					15 th MAY							
Bison or Buffalo, Elk or Wapiti, Female Deer or Fawns of Deer under one year of age, Grouse of any variety, Prairie Chicken or Partridge.												
Swans, Mourning Dove, Wild Pigeon, Band Tailed Pigeon, Little Brown Crane, Sandhill Crane, Whooping Crane, Quail or Curlew, Wood Duck, Elder Duck, Sandpiper, Pheasant and Hungarian Partridge before Sept. 15th, 1927.												
Brent, Wild Geese, Scoters or Wild Duck, Black Breasted and Golden Plover, Wilson or Jack Snipe, Woodcock and Yellow Legs.									15 th SEP			
Ptarmigan.									20 th OCT			

Licenses

Before commencing shooting, hunting, trapping or fur trading a license must be obtained. The fees vary according to the nature of the license and the place of residence of the applicant. The storage, sale and export of meat, furs, heads, etc., is also regulated. Application for fuller particulars should be made to

CHAS. BARBER,
Chief Game Guardian,
 Winnipeg Manitoba,

5. FOREST FIRES**Their Prevention and Suppression*****EXTRACTS FROM "THE FIRES PREVENTION ACT—MANITOBA**

7. Any person who shall kindle and leave a fire burning, without taking effectual means to prevent its spreading in or on any woods, prairies, meadows, marshes or other open grounds, not his own property, or who, intentionally or by gross carelessness, permits any such fire to pass from his own land to the injury of the property of any other person, shall, on conviction therefor, be fined in a sum not exceeding one hundred dollars, nor less than twenty dollars, and, in default of payment thereof, shall be imprisoned for a term not exceeding six months.

9. Any person shall be permitted to make or start a fire in any wood prairie, meadow, marsh or other open ground, for cooking, warmth or other industrial purposes; but such person, before so doing, shall—

(a) select a locality in the neighbourhood in which there is the smallest quantity of combustible material or the least likelihood of fire spreading;

(b) clear the space in which he is to light the fire by removing all vegetable matter, dead trees, branches, brushwood and dried leaves from the soil within a radius of ten feet from the fire.

(2) He shall also exercise and observe every reasonable care and precaution to prevent such fire from spreading, and carefully extinguish the same before quitting the place.

(NOTE:—No other fires than mentioned in clause 9 shall be started in any wooded district from the first day of April to the fifteenth day of November in any year except on written permission from a fire guardian.)

13. Any person who throws away or drops any burning match, ashes of a pipe, lighted cigar or cigarette, or any other burning substance, or who discharges any firearms, shall completely extinguish, before leaving the spot, the fire of such match, ashes of a pipe, cigar, cigarette, wadding of the firearm or other burning substance.

14. Every person guilty of a violation of the last preceding section shall be liable, upon summary conviction before any justice of the peace, to a fine not exceeding one hundred dollars, and, in default of payment, for a term of imprisonment not to exceed six months, and in addition he shall be liable for all damage caused by any fire resulting from a violation of the said section at the suit of any person suffering such damage.

6. Injurious Forest Insects—Manitoba†

The forests of Northern Manitoba suffer from injuries by many species of insects. Some of these devour the foliage, others excavate tunnels in the living bark or wood and either kill the trees or seriously weaken them, and a few of

* Forestry Branch, Department Interior, Ottawa.

† J. M. Swaine, Assistant Entomologist in charge of forest insect investigation, Entomological Branch, Department of Agriculture, Ottawa.

the most injurious cut large tunnels in the wood of recently killed timber and logs.

The Larch Sawfly the most destructive enemy of the larch, has recently spread westward into Northern Manitoba, and many trees have already been killed by it. The sawfly larvae feed upon the larch needles and defoliate the trees very rapidly. This species has killed a large part of the larch in Eastern Canada and will probably be quite as injurious in the forests north of the prairies.

The Larch Sawfly is preyed upon by several species of native parasites, but, unfortunately, they are seldom able to check its activity before the trees have been seriously injured. The sawfly also occurs in England, but species of small parasitic flies, native to that country, are able to hold it fairly well in check. Several years ago the Entomological Branch imported from England large quantities of cocoons infested with these valuable parasites, and they were distributed in sawfly-infested larch swamps in the Riding Mountain Reserve and in the Spruce Woods Reserve of Manitoba. Last summer it was determined that these beneficial parasites had become established in the spruce woods reserve, and it is hoped that they will eventually become an important factor in controlling the Larch Sawfly in this country. When this insect attacks cultivated larches it is readily controlled by spraying the foliage with either lead arsenate or Paris green.

Bark-beetles of different species kill spruce and pine in considerable amount in the Riding Mountains and northwards. The Two-eyed Spruce Bark-beetle is the most destructive of these.

Pine and spruce logs and standing trees killed by fire or bark-beetles or any other cause, are usually very badly injured or ruined by the tunnels of large boring grubs if left unprotected in the woods for two seasons or even for one. The chief injury is caused by large, whitish, legless, boring grubs, the young of very large long-horned beetles, grayish or black in colour, and commonly known as Sawyers.

The beetles fly about in the sunshine and lay their eggs in the slits cut in the bark of dying trees and logs. The young grubs feed upon the inner bark and sapwood for several weeks and then excavate an oval tunnel nearly as large as one's little finger down deep into the wood. The tunnel usually passes across the fibers far in toward or quite to the heart and then out again to the surface. The grub spends two seasons in the wood and changes to the adult beetle, which cuts its way out through the bark about two years after the eggs were laid.

These beetles are very abundant in the forest areas of Northern Manitoba and everywhere throughout our eastern coniferous forests.

Efforts to prevent injury by these grubs will include: prevention of egg-laying by densely shading or watering the logs; destruction of the grubs already in the bark before the wood is injured by barking the logs or watering them in the early season; and the reduction of the numbers of the beetles by systematic destruction of their breeding places—in other words slash-burning.